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60/308,139 27 July 2001 (27.07.2001) **US**
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(54) Title: ADJUVANT FORMULATIONS FOR BACTERIAL AND VIRUS VACCINES AND METHOD OF MAKING SAME

(57) Abstract: A pharmaceutical composition including an adjuvant effective amount of a protected inosine monophosphate (IMP) compound. The pharmaceutical composition includes the protected IMP compound alone, or in combination with vaccine agents with or without additional adjuvants. The pharmaceutical composition can be utilized as a vaccine composition or can be included with existing vaccine compositions in order to increase a specific T lymphocyte mediated immune response thereto. Various methods relating to the pharmaceutical composition and the vaccine are described herein. The vaccines can be employed to prevent or treat infections. Additionally, the pharmaceutical compositions not only increase T-cell responses, but also confer, by pretreatment, nonspecific protection against a variety of pathogens. This combination of actions is appropriate for enhancing defense against bioterrorism with organisms like smallpox or anthrax.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/23765

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61K 31/70

US CL : 514/42, 45; 536/26.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 514/42, 45; 536/26.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SOSA et al., Immunopharmacologic properties of inosine 5'-methyl monophosphate, Ann NY Academy Sci., Vol. 685, pp. 458-63 June 23, 1993.	1-36
X	HADDEN et al. Methyl inosine monophosphate, a new purine immunomodulator for HIV infection, Vol. 13, 1991, pp. 49-54.	1-36
X	NATARAJAN. R. Synthesis and biological properties of purine and pyrimidine 5'-deoxy-5'-(dihydroxyphosphinyl)-beta-D-ribofuranosyl analogues of AMP, GMP, IMP and CMP, J. Med. Chem., Vol. 32(6), 1989, pp. 1307-1313.	1-36
X — Y	HADDEN. J.W. Methyl Monophosphate (MIMP), A New Purine Immunomodulator for HIV Infection. Intl. J. Immunopharmacology, Vol. 13, pp. 49-54.	1-7, 11-4, 6, 15-18, 21, 25-34
Y	SZABADOS. E. Inosine -5'-monophosphate analogues as inhibitors of Human IMP Cyclohydrolase and Cellular Growth. March 1998, Vol. 44. No. 3, pages 617-623.	7-14, 19, 20, 22, 23 1-36
X	THOMPSON. L. Inosine 5'-Monophosphate vs Inosine and Hypoxanthine as Substrates for Purine Salvage in Human Lymphoid Cells. 1985. Vol. 179, pages 432-436	1-5, 8-11, 30, 33 6, 7, 12-29, 31, 32, 34-36

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"P"	document published prior to the international filing date but later than the priority date claimed		

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